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10/781,542	02/17/2004	Kartikeya Chandrayana	1209-53	3368

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EXAMINER	
JAKOVAC, RYAN J	
ART UNIT	**PAPER NUMBER**
4121	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/781,542	CHANDRAYANA ET AL.	
	Examiner	Art Unit	
	Ryan J. Jakovac	4121	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02/17/2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *02/17/2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *03/12/2004,07/08/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This action is responsive to communication filed on 02/17/2004

Claims 1-11 are pending.

Claims 1-11 are rejected.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claim 1 rejected under 35 U.S.C. 102(e) as being anticipated by US 6,831,895 to Ji et al (hereinafter Ji).

In regards to claim 1, Ji teaches a method for balancing traffic across paths connecting a network to the Internet comprising: forming a connection between a home network and a large network which connects to a plurality of networks (Col. 4, line 45-50. The IP tuner operates in a network (i.e. home network) comprising of routers interconnected with the internet, col. 1, line 5-45.), wherein said connection comprises a plurality of paths carrying traffic in the form of data packets between the home network and said large network (Col. 4, line 25-35, Router sends packets of information along

network paths.), and wherein each path has a path load (Col. 1, line 65-67 to Col. 2, line 1-9, Each link has a given weight (i.e. load) that governs the amount of traffic or number of messages which may flow across it.); selecting one of said plurality of paths, wherein said plurality of paths comprises said selected path and other paths, and wherein said selected path has a traffic load and an initial overload (Col. 6, line 1-7, A congested link is selected from among the total set of congested links (Fig. 3A, number 102). Col. 1, line 65-67 to Col. 2, line 1-9, Each link has a given weight (i.e. load) that governs the amount of traffic or number of messages which may flow across it.); measuring the amount of traffic from the home network to the large network over the selected path (Fig. 3D, number 129, The maximum traffic across the next path is measured.); measuring the congestion over the selected path (Col. 5, line 33-38, The IP tuner uses MIB data to determine the congestion of a link.); measuring the available capacity over the selected path (Fig. 3D, number 129, The maximum traffic across the next path is measured.); choosing the path load for each of said plurality of paths using a fractional allocation strategy path, wherein the time to generate information is minimized and the amount of traffic lost to overloads is minimized (Fig. 3D, number 128-131, Splitting factors are determined and applied. The path load chosen and routed.); and distributing a portion of the traffic from the selected path to the other paths (Fig. 3D, number 132, Traffic is diverted to the next link.).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 2-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ji in view of US 6963927 to Lee et al. (hereinafter Lee).

In regards to claim 2, Ji teaches the method for balancing traffic across paths connecting a network to the Internet according to claim 1, Ji does not teach but Lee teaches wherein the fractional allocation strategy comprises:

(a) associating the paths with a counter i, wherein the counter is a number equal to one (1) and there are a total of j paths (Lee, Col. 1, line 8-13, An iterative method of load balancing is used);

(b) calculating the total initial selected path overload (Lee, Col. 5, line 18-23, When the load reaches a preset threshold another path is chosen);

(c) calculating the selected path load, wherein the load is equal to the initial selected path overload less the sum of the low capacity boundary for i path(s) (Lee, Col. 5, line 47-59 Threshold levels of links are determined);

(d) calculating the portion of the traffic on the selected path to be distributed using a bi-sectional search strategy (Lee, Col. 5, line 48-59, Each link determined to be appropriate is compared to a threshold level with respect to bandwidth utilization level);

(e) distributing a portion of the traffic on the selected path to the other paths (Fig. 4, number 422, The circuit is provisioned); and

(f) stopping if there are no more paths (I=j), otherwise increasing the numerical value of the counter by one (1) and go to step (c) (Lee, Col. 1, line 8-13, An iterative method of load balancing is used).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine wherein the fractional allocation strategy comprises:

(a) associating the paths with a counter i, wherein the counter is a number equal to one (1) and there are a total of j paths;

(b) calculating the total initial selected path overload;

(c) calculating the selected path load, wherein the load is equal to the initial selected path overload less the sum of the low capacity boundary for i path(s);

(d) calculating the portion of the traffic on the selected path to be distributed using a bi-sectional search strategy;

(e) distributing a portion of the traffic on the selected path to the other paths; and

(f) stopping if there are no more paths (I=j), otherwise increasing the numerical value of the counter by one (1) and go to step (c).

as taught by Lee with the method of Ji so as to be able to determine the appropriate link with respect to bandwidth utilization level (Lee, Col. 5, line 52-55).

In regards to claim 3, the combination Ji and Lee teaches the method for balancing traffic across paths connecting a network to the Internet according to claim 1,

wherein the portion of the traffic is distributed to the other paths using the equation (Lee, Col. 5, line 45-59, The shortest path algorithm using threshold level comparison bandwidth utilization level produce equivalent results as the equation in claim 3.) wherein x_i is the path load (Lee, Col. 5, line 17-19, The bandwidth utilization level), l_i is low capacity boundary (Lee, Col. 5, line 19-20, Preset threshold level), h_i is high capacity boundary (Lee, Col. 5, line 19-20, Preset threshold level), P is the total number of paths (Lee, Col. 5, line 14-15, The start node to the end node) and $x_0(0)$ is the initial overload on the selected path (Lee, Col. 5, line 48-59, The algorithm checks for over utilization of bandwidth).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine wherein the portion of the traffic is distributed to the other paths using the equation wherein x_i is the path load, l_i is low capacity boundary, h_i is high capacity boundary, P is the total number of paths and $x_0(0)$ is the initial overload on the selected path as taught by Lee with the method of the combination of Ji and Lee in order to be able to determine the appropriate link with respect to bandwidth utilization level (Lee, Col. 5, line 52-55).

In regards to claim 4, the combination Ji and Lee teaches the method for balancing traffic across paths connecting a network to the Internet according to claim 2, wherein the portion of the traffic is distributed to the other paths using the equation (Lee, Col. 5, line 45-59, The shortest path algorithm using threshold level comparison bandwidth utilization level produce equivalent results as the equation in claim 3.)

wherein x_i is the path load (Lee, Col. 5, line 17-19, The bandwidth utilization level), l_i is low capacity boundary (Lee, Col. 5, line 19-20, Preset threshold level), h_i is high capacity boundary (Lee, Col. 5, line 19-20, Preset threshold level), P is the total number of paths (Lee, Col. 5, line 14-15, The start node to the end node) and $x_0(0)$ is the initial overload on the selected path (Lee, Col. 5, line 48-59, The algorithm checks for over utilization of bandwidth).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine wherein the portion of the traffic is distributed to the other paths using the equation wherein x_i is the path load, l_i is low capacity boundary, h_i is high capacity boundary, P is the total number of paths and $x_0(0)$ is the initial overload on the selected path as taught by Lee with the method of the combination of Ji and Lee in order to be able to determine the appropriate link with respect to bandwidth utilization level (Lee, Col. 5, line 52-55).

In regards to claim 5, the combination Ji and Lee teaches the method for balancing traffic across paths connecting a network to the Internet according to claim 2, wherein the bi-sectional search strategy uses a multidimensional iterative bisection search algorithm (Col. 5, line 45-50, The algorithm calculates portion of traffic on selected path by using shortest path threshold level comparison to select a link).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine wherein the bi-sectional search strategy uses a multidimensional iterative bisection search algorithm as taught by Lee with the method

of the combination of Ji and Lee in order to be able to determine the appropriate link with respect to bandwidth utilization level (Lee, Col. 5, line 52-55).

3. Claims 6, 7, 9, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ji in view of US 20040193728 to Doshi et al. (hereinafter Doshi).

In regards to claim 6, Ji teaches the method for balancing traffic across paths connecting a network to the Internet according to claim 1, Ji does not teach but Doshi teaches wherein the cost is measured using the equation of claim 6 and wherein C is the cost, T is the time period over which the feasible solution is obtained, P is the number of paths between the home network and the large network, x is path load and c is the capacity of the path at time t (Doshi, Paragraph [0025], The routine for calculating link cost shown in Figure 10 produces the same results. Figure 10 shows a routine for calculating the link cost as a function of sharing and link utilization.).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine wherein the cost is measured using the equation of claim 6 and wherein C is the cost, T is the time period over which the feasible solution is obtained, P is the number of paths between the home network and the large network, x is path load and c is the capacity of the path at time t as taught by Doshi with the method of Ji so as to be able to calculate cost as a function of sharing and link utilization (Doshi, paragraph [0025]).

In regards to claim 7, the combination of Ji and Doshi teaches the method for balancing traffic across paths connecting a network to the Internet according to claim 1,

wherein the amount of traffic from the home network to the large network over the selected path is measured using flow level measurements or Simple Network Management Protocol (SNMP) (Doshi, Paragraph [0077], Signaling is used to establish the primary path using SNMP).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine wherein the amount of traffic from the home network to the large network over the selected path is measured using flow level measurements or Simple Network Management Protocol as taught by Doshi with the method of the combination of Ji and Doshi in order to calculate and establish a primary path and to calculate a protection path as well as to reserve bandwidth for a protection path (Doshi, paragraph [0077]).

In regards to claim 9, the combination of Ji and Doshi teaches the method for balancing traffic across paths connecting a network to the Interact according to claim 1, wherein the congestion over the selected path is measured using Transmission Control Protocol (TCP) Synchronize/Acknowledgement (SYN/ACK) response time (Doshi, Paragraph [0077], [0181], Signaling is used to establish the primary path using TCP.).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine wherein the congestion over the selected path is measured using Transmission Control Protocol (TCP) Synchronize/Acknowledgement (SYN/ACK) response time as taught by Doshi with the method of the combination of Ji and Doshi in order to calculate and establish a primary path and to calculate a

protection path as well as to reserve bandwidth for a protection path (Doshi, paragraph [0077]).

In regards to claim 11, the combination of Ji and Doshi teaches the method for balancing traffic across paths connecting a network to the Internet according to claim 1, wherein the available capacity over the selected path is measured using flow level measurements, Simple Network Management Protocol (SNMP) link measurements, Round Trip Time (RTT), loss measurements, active probes, or Transmission Control Protocol (TCP) Synchronize/Acknowledgement (SYN/ACK) response time (Doshi, Paragraph [0077], Signaling is used to establish the primary path using TCP, Paragraph [0181]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine wherein the available capacity over the selected path is measured using flow level measurements, Simple Network Management Protocol (SNMP) link measurements, Round Trip Time (RTT), loss measurements, active probes, or Transmission Control Protocol (TCP) Synchronize/Acknowledgement (SYN/ACK) response time as taught by Doshi with the method of the combination of Ji and Doshi in order to calculate and establish a primary path and to calculate a protection path as well as to reserve bandwidth for a protection path (Doshi, paragraph [0077]).

4. Claims 8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ji in view of US 6865510 to Engbrecht.

In regards to claim 8, Ji teaches the method for balancing traffic across paths connecting a network to the Internet according to claim 1, Ji does not teach but Engbrecht teaches wherein the congestion over the selected path is measured using active probes, or passive measurements of traffic details (Engbrecht, Col. 3, line 30-40, The result of a network probe is used to select optimal path based of efficiency in a specific direction.)

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine wherein the congestion over the selected path is measured using active probes, or passive measurements of traffic details as taught by Engbrecht with the method of Ji so as to be able to determine efficient data transfer paths (Engbrecht, Col. 3, line 30-40).

In regards to claim 10, the combination of Ji and Engbrecht teaches the method for balancing traffic across paths connecting a network to the Internet according to claim 1, wherein the congestion over the selected path is measured using Round Trip Time (RTT), and loss measurements (Engbrecht, Col. 7, line 44-51, The network probe includes round trip latency.).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine wherein the congestion over the selected path is

measured using Round Trip Time (RTT), and loss measurements as taught by Engbrecht with the method of the combination of Ji and Engbrecht so as to be able to determine efficient data transfer paths (Engbrecht, Col. 3, line 30-40).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ryan J. Jakovac whose telephone number is (571) 270-5003. The examiner can normally be reached on Monday through Friday, 7:30 am to 5:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Taghi T. Arani can be reached on (571) 272-3787. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

RJ

TAGHI ARANI
PRIMARY EXAMINER
10/25/07